

## CLAIMS

1. A radio communication system having a communication channel comprising a plurality of paths between first and second terminals each having a plurality of antennas, wherein the first terminal comprises receiving means having direction determining means for determining a plurality of directions from which signals arrive from the second terminal, means for receiving a plurality of respective signals from some or all of the plurality of directions, means for extracting a plurality of sub-streams from the received signals and means for combining the plurality of sub-streams to provide an output data stream, and the first terminal further comprises transmitting means having means for separating a signal for transmission into a plurality of sub-streams, and transmitting means for transmitting each sub-stream into a respective one of the plurality of directions determined by the receiving means.
2. A system as claimed in claim 1, characterised in that the receiving means further comprises means for determining an angular power distribution of incoming signals.
3. A system as claimed in claim 2, characterised in that the direction determining means further comprises means for selecting as the plurality of directions those directions from which the strongest signals arrive from the second terminal.
4. A terminal for use in a radio communication system having a communication channel comprising a plurality of paths between the terminal and another terminal, wherein receiving means are provided having direction determining means for determining a plurality of directions from which signals arrive from the other terminal, and transmitting means are provided having means for separating a signal for transmission into a plurality of sub-streams, and transmitting means for transmitting each sub-stream into a respective one of the plurality of directions determined by the receiving means.

5. A terminal as claimed in claim 4, characterised in that the receiving means further comprises means for receiving a plurality of respective signals from some or all of the plurality of directions, means for extracting a plurality of sub-streams from the received signals and means for combining the plurality of sub-streams to provide an output data stream.

6. A terminal as claimed in claim 5, characterised in that the numbers of transmitted and received sub-streams are not equal.

7. A terminal as claimed in claim 4, characterised in that the receiving means further comprises means for determining an angular power distribution of incoming signals.

8. A terminal as claimed in claim 7, characterised in that the direction determining means further comprises means for selecting as the plurality of directions those directions from which the strongest signals arrive from the second terminal.

9. A terminal as claimed in claim 4, characterised in that the transmitting means includes control means for operating the plurality of antennas as an array and operable to adapt the antenna pattern for each sub-stream such that a peak in the antenna pattern corresponds to the respective direction and nulls in the antenna pattern correspond to the directions in which other sub-streams are transmitted.

10. A terminal as claimed in claims 4, characterised in that the transmitting means includes control means for independently adjusting the power and/or bitrate of each sub-stream depending on a signal quality parameter of the sub-stream.

11. A terminal for use in a radio communication system having a communication channel comprising a plurality of paths between the terminal

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and another terminal, wherein receiving means are provided having direction determining means for determining a plurality of directions from which signals arrive from the other terminal, means for receiving a plurality of respective signals from some or all of the plurality of directions, means for extracting a plurality of sub-streams from the received signals and means for combining the plurality of sub-streams to provide an output data stream.

12. A method of operating a radio communication system having a communication channel comprising a plurality of paths between first and second terminals each having a plurality of antennas, the method comprising the first terminal determining a plurality of directions from which signals arrive from the second terminal, receiving signals from some or all of the plurality of directions, extracting a plurality of sub-streams from the received signals and combining the plurality of sub-streams to provide an output data stream, the method further comprising the first terminal separating a signal for transmission into a plurality of sub-streams, and transmitting each sub-stream into a respective one of the plurality of determined directions.

13. A method as claimed in claim 12, characterised by independently adjusting the power and/or bitrate of each transmitted sub-stream depending on a signal quality parameter of the sub-stream.

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